Blue Grass Pit
Warrick County
Largemouth Bass Supplemental Survey

Date of Survey: March 19 and 26, 2007

Biologist: Daniel P. Carnahan

Survey Objectives: Monitor the largemouth bass population under the 18.0-in minimum length limit and 2 bass bag limit at Blue Grass Pit.

Methods: Largemouth bass were sampled with 3.25 h of pulsed DC night electrofishing with two dippers at the 173-acre pit. All bass were measured to the nearest 0.1 in TL. Weights were estimated from the 2005 supplemental survey. Scale samples were taken from a subsample of bass for age and growth analysis. Proportional and relative stock density indices were used to assess the population (Anderson and Neuman 1996). Analysis of variance was used to statistically test if there were any significant changes to growth, stock indices, and CPUE. Fisheries Analysis Simulation Tools (FAST) software was used to model the bass population under different minimum length limits (MLL) (Slipke and Maceina 2000).

Summary: A total of 518 largemouth bass was sampled that weighed 260 lbs. They ranged in length from 4.4 to 19.7 in. Bass growth was good as shown in the age-length key in Appendix 1. From 2006 to 2007 age-4 and age-5 bass grew an average of 2.8 in. Age-4 through age-6 bass averaged 12.0, 14.9, and 17.1 in. The age-7 cohort was the only cohort that showed a significant improvement in growth since 2004 (F = 18.38, df = 3, P = 0.05). It currently is taking 7 years for a bass to reach 18.0 in. Growth has been steady over the last 4 years for all other ages as indicated by the growth curve (Figure 1). Otoliths should be taken during the 2008 supplemental survey from a subsample of bass to improve the accuracy of the age and growth analysis.

The PSD was 21 and did not change from 2006. The RSD14 decreased from 13 to 7 and the RSD18 decreased from 4 to 1. These decreases were not significant compared to previous years (F = 0.05, df = 4, P = 0.83) (F = 0.06, df = 4, P = 0.81). The overall electrofishing catch rate increased from 145.1/h to 159.4/h. None of the electrofishing catch rates were found to be significantly different. However, the catch rate for bass larger than 14.0 in (9.2/h) stayed about

the same from 2006, but has more than tripled since 2004. The catch rates for bass larger than 18.0 in has ranged from 0.5 to 2.9/h since 2004 and was 1.8/h in 2007.

Modeling the bass population through FAST indicates that the 18.0-in MLL will produce the most 18.0-in bass. The population was modeled under a 12.0, 14.0, and 18.0-in MLL. Population parameters used were 0.30 for conditional natural mortality, and a range of conditional fishing mortalities (cf) from 0.05 to 0.30. The model indicated that there is a 12% (cf = 0.05) to 122% (cf = 0.30) increase in the number of bass greater than 18.0 in under the 18.0-in MLL versus the 14.0-in MLL. The difference was even greater when comparing the 18.0-in MLL versus the 12.0-in MLL. It is assumed that cf is low at Blue Grass Pit since the bass harvest in 2005 was negligible (Weinman 2006), but fishing pressure has noticeably increased in 2007 since the use of outboard motors was legalized on January 1. Fishing pressure and bass harvest will be evaluated in the 2009 angler creel survey.

Literature Cited:

Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-481 *in* B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

Slipke, J. W. and M. J. Maceina. 2000. Fishery analyses and simulation tools. Auburn University, Auburn, Alabama.

Weinman, M. L. 2006. Bluegrass Pit and Loon Pit angler creel survey and largemouth bass survey. Indiana Department of Natural Resources. Indianapolis. 26 pp.

Submitted by: Daniel P. Carnahan, District 7 Fisheries Biologist
Date: August 8, 2007

Approved by: Brian M. Schoenung, Fisheries Supervisor

Date: June 12, 2008

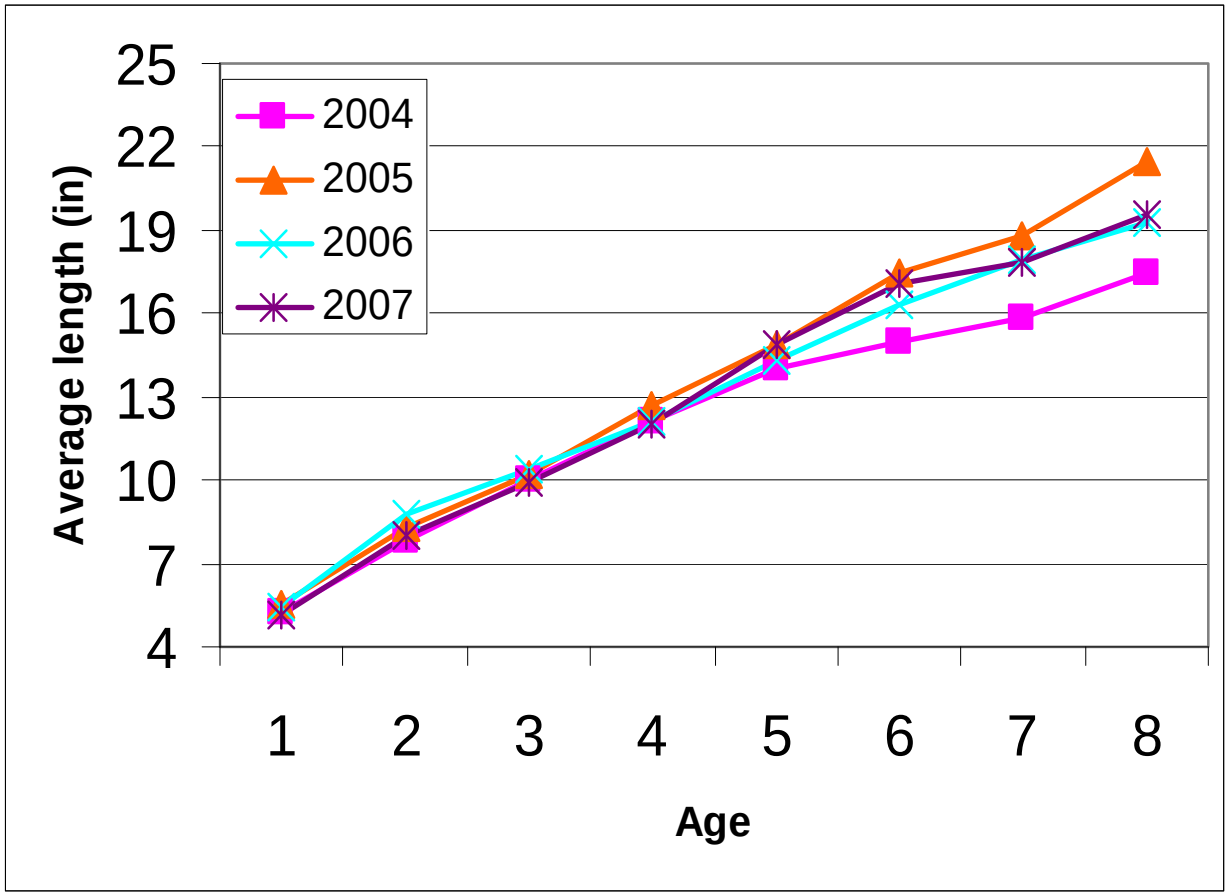

Figure 1. Largemouth bass growth, Blue Grass Pit, 2004 through 2007.

APPENDIX 1

Largemouth bass supplemental survey data, Blue Grass Pit, 2007.

LAKE SURVEY REPORT

Type of Survey: [ ] Initial Survey [X] Re-Survey

Lake Name	County	Date of survey (Month, day, year)
Blue Grass Pit	Warrick	March 19 & 26, 2007
Biologist's name		**Date of approval (Month, day, year)**
Daniel P. Carnahan		June 12, 2008

LOCATION

Quadrangle Name	Range	Section
Elberfeld	9W	31
Township Name	**Nearest Town**	
4S	Elberfeld	

ACCESSIBILITY

State owned public access site	Privately owned public access site	Other access site
One concrete and one gravel boat ramp		

Surface acres	Maximum depth	Average depth	Acre feet	Water level	Extreme fluctuations
173	57	25	4,325	unknown	8 ft

Location of benchmark

INLETS

Name	Location	Origin
Blue Grass Creek	Northwest side of Blue Grass Pit	

OUTLETS

Name	Location
Culvert pipe to Loon Pit	South end of Blue Grass Pit

Water level control

POOL	ELEVATION (Feet MSL)	ACRES
TOP OF DAM		
TOP OF FLOOD CONTROL POOL		
TOP OF CONSERVATION POOL		173
TOP OF MINIMUM POOL		
STREAMBED		

Bottom type

- [ ] Boulder
- [ ] Gravel
- [ ] Sand
- [X] Muck
- [ ] Clay
- [ ] Marl

Watershed use

Reclaimed coal strip mine ground.

Development of shoreline

None

Previous surveys and investigations

Supplemental survey: 2000, 2004, 2005, 2006.

Standard fisheries survey: 2001.

Crappie survey: 2005.

Angler creel survey: 2003, 2005.

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF LARGEMOUTH BASS									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0	1	0.2	3.95	8
1.5					19.5	2	0.4	4.04	8
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0	2	0.4	0.03	1	22.0				
4.5	7	1.4	0.04	1	22.5				
5.0	15	2.9	0.06	1, 2	23.0				
5.5	3	0.6	0.08	1, 2	23.5				
6.0	1	0.2	0.10	1	24.0				
6.5	6	1.2	0.13	1, 2	24.5				
7.0	27	5.2	0.16	2	25.0				
7.5	53	10.2	0.20	2	25.5				
8.0	63	12.2	0.24	2	26.0				
8.5	43	8.3	0.28	2, 3	TOTAL	518			
9.0	34	6.6	0.33	2, 3					
9.5	42	8.1	0.39	2, 3					
10.0	47	9.1	0.46	3					
10.5	29	5.6	0.53	3					
11.0	37	7.1	0.62	3, 4					
11.5	24	4.6	0.71	4					
12.0	27	5.2	0.80	4					
12.5	17	3.3	0.91	4					
13.0	5	1.0	1.02	4					
13.5	6	1.2	1.15	4, 5					
14.0	6	1.2	1.31	4, 5					
14.5	3	0.6	1.47	5					
15.0	7	1.4	1.68	5					
15.5	2	0.4	1.88	5, 6					
16.0	3	0.6	2.08	5					
16.5									
17.0	3	0.6	2.56	6					
17.5	2	0.4	2.77	6, 7					
18.0	1	0.2	3.19	not aged					
18.5									

ELECTROFISHING CATCH	159.4/h	GILL NET CATCH	N/A	TRAP NET CATCH	N/A

LARGEMOUTH BASS AGE-LENGTH KEY

Length group (in)	Total number	Sub-sample	AGE 1	2	3	4	5	6	7	8
4.0	2	2	2							
4.5	7	6	7							
5.0	15	4	11	4						
5.5	3	3		3						
6.0	1	1	1							
6.5	6	6	1	5						
7.0	27	5		27						
7.5	53	5		53						
8.0	63	5		63						
8.5	43	4		22	22					
9.0	34	5		14	20					
9.5	42	6		7	35					
10.0	47	5			47					
10.5	29	5			29					
11.0	37	6			6	31				
11.5	24	5				24				
12.0	27	6				27				
12.5	17	3				17				
13.0	5	4				5				
13.5	6	6				2	4			
14.0	6	6				2	4			
14.5	3	3					3			
15.0	7	7					7			
15.5	2	2					1	1		
16.0	3	2					3			
16.5										
17.0	3	3						3		
17.5	2	2						1	1	
18.0	1	0								
18.5										
19.0	1	1								1
19.5	2	1								2
Totals	518	119	22	197	159	108	22	5	1	3

AGE-LENGTH KEY SUMMARY

Age	Number	Mean TL	Var	SE	Lower 95%CI	Upper 95%CI
1	22	5.1	0.31	0.12	4.9	5.4
2	197	8.0	0.66	0.06	7.9	8.1
3	159	9.9	0.48	0.05	9.8	10.0
4	108	12.0	0.51	0.07	11.9	12.2
5	22	14.9	0.67	0.17	14.5	15.2
6	5	17.1	0.58	0.34	16.4	17.7
7	1	17.8				
8	3	19.6	0.08	0.17	19.3	19.9

GPS LOCATION OF SAMPLING EQUIPMENT								
GILL NETS			TRAP NETS			ELECTROFISHING		
1	N	W	1	N	W	1	N 38.35372	W -87.23302
2	N	W	2	N	W		N 38.09308	W -87.46273
3	N	W	3	N	W	2	N 38.09370	W -87.46257
4	N	W	4	N	W		N 38.09255	W -87.46088
5	N	W	5	N	W	3	N 38.09258	W -87.46068
6	N	W	6	N	W		N 38.09268	W -87.45820
7	N	W	7	N	W	4	N 38.09265	W -87.45817
8	N	W	8	N	W		N 38.09307	W -87.45655
9	N	W	9	N	W	5	N 38.09357	W -87.45735
10	N	W	10	N	W		N 38.09440	W -87.46040
11	N	W	11	N	W	6	N 38.35372	W -87.23302
12	N	W	12	N	W		N 38.09308	W -87.46273
13	N	W	13	N	W	7	N 38.09370	W -87.46257
14	N	W	14	N	W		N 38.09255	W -87.46088
15	N	W	15	N	W	8	N 38.09258	W -87.46068
16	N	W	16	N	W		N 38.09268	W -87.45820
17	N	W	17	N	W	9	N 38.09265	W -87.45817
18	N	W	18	N	W		N 38.09307	W -87.45655
19	N	W	19	N	W	10	N 38.09357	W -87.45735
20	N	W	20	N	W		N 38.09440	W -87.46040
						11	N 38.09327	W -87.45610
							N 38.09490	W -87.45837
						12	N 38.09472	W -87.45832
							N 38.09510	W -87.46110
						13	N 38.09693	W -87.46262
							N 38.09482	W -87.46123
						14	N	W
							N	W
						15	N	W
							N	W
						16	N	W
							N	W
						17	N	W
							N	W
						18	N	W
							N	W
						19	N	W
							N	W
						20	N	W
							N	W